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10/629,825	07/30/2003	James R. Ellsworth	70869-0113US	7295

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CLARK & BRODY
Suite 600
1750 K Street, NW
Washington, DC 20006

EXAMINER	
COOLEY, CHARLES E	
ART UNIT	**PAPER NUMBER**
1723	

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/629,825	ELLSWORTH ET AL.	
	Examiner	Art Unit	
	Charles E. Cooley	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) *4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-4* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 December 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01162004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

NON-FINAL OFFICE ACTION

1. This application has been assigned to Technology Center 1700, Art Unit 1723 and the following will apply for this application:

Please direct all written correspondence with the correct application serial number for this application to Art Unit 1723.

Telephone inquiries regarding this application should be directed to the Electronic Business Center (EBC) at http://www.uspto.gov/ebc/index.html or 1-866-217-9197 or to the Examiner at (571) 272-1139. All official facsimiles should be transmitted to (703) 872-9306.

2. As the PTO continues to move towards a fully electronic environment, the office will phase-in its E-Patent Reference program. This program: (1) provides downloading capability of the U.S. patents and U.S. patent application publications cited in Office actions via the E-Patent Reference feature of the Office's PAIR system; and (2) ceases mailing paper copies of U.S. patents and U.S. patent application publications with office actions except for citations made during the international stage of an international application under PCT.

Effective June 2004, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions from this Technology Center. Paper copies of foreign patents and non-patent literature will continue to be included with office actions.

The U.S. patents and patent application publications cited in office actions are available for download via the Office's PAIR system. As an alternate source, all U.S.

patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Inquiries about the use of the Office's PAIR system should be referred to the Electronic Business Center (EBC) at http://www.uspto.gov/ebc/index.html or 1-866-217-9197.

Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

Election/Restriction Requirement

3. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-3, drawn to a centrifuge, classified in class 494, subclass 20.

II. Claim 4, drawn to a chambered receptacle, classified in class 422, subclass 102.

The inventions are distinct, each from the other because of the following reasons:

4. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because it does not require a chambered receptacle with a lid and sacrificial portion. The subcombination has separate utility such as its use to hold fluids without being centrifuged in the centrifuge combination.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification and because the search required for Group is a divergent search, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Atty. Conrad Clark on 14 APRIL 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-3 drawn to centrifuge. Affirmation of this election must be made by applicant in replying to this Office action. Claim 4 is thereby withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

8. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows:

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence(s) of the specification or in an application data sheet by identifying the prior application by application number (37 CFR 1.78(a)(2) and (a)(5)). If the prior application is a non-

provisional application, the specific reference must also include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

9. If applicant desires benefit of a previously filed application under 35 U.S.C. 119(e), specific reference to the earlier filed application must be made in the instant application. This should appear as the first sentence(s) of the specification following the title, preferably as a separate paragraph unless it appears in an application data sheet. The status of nonprovisional parent application(s) (whether patented or abandoned) should also be included. If a parent application has become a patent, the expression "now Patent No. _____" should follow the filing date of the parent application. If a parent application has become abandoned, the expression "now abandoned" should follow the filing date of the parent application.

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not

extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Information Disclosure Statement

10. Note the attached PTO-1449 forms submitted with the Information Disclosure Statement filed 16 JAN 2004

Drawings

11. The formal drawings filed 4 DEC 2003 are objected to because of the following informalities:

a. the decant ring 24 should be labeled in Fig. 2 (see [0018]).

b. the subject matter of claims 1-2 and paragraphs [0023] - [0026] of the specification are poorly shown in the drawing Figures.

Correction is required.

12. Applicant should verify that (1) all reference characters in the drawings are described in the detailed description portion of the specification and (2) all reference characters mentioned in the specification are included in the appropriate drawing Figure(s) as required by 37 CFR 1.84(p)(5).

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment. Any replacement drawing sheet must be identified in the top margin as "Replacement Sheet" (37 CFR 1.121(d)) and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheets must be clearly labeled as "Annotated Marked-up Drawings" and accompany the replacement sheets.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Specification

13. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

14. The disclosure is objected to because of the following informalities:

a. Paragraph [0025], line 2: it appears "insolating" should be --insulating--.

Appropriate correction is required.

15. The use of the trademark DELRIN has been noted in this application. Trademarks should be capitalized wherever it they appear and be accompanied by the generic terminology. Paragraph [0019] requires correction.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

16. The abstract is acceptable.

17. The title is acceptable.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

19. Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Miura et al. (US 6,338,708).

The patent to Miura et al. discloses a centrifuge comprising a base 3; an enclosure 5 mounting a motor therein; a rotor 1 rotatably mounted on said motor; a resilient support 4 extending between said base 3 and said enclosure 5; wherein said support 4 engages said enclosure at a location that is inherently aligned with the force applied by said rotor resulting from imbalance of said rotor since the support is adapted to damp the imbalance forces; said support 4 comprises a resilient element that engages said enclosure 5.

More particularly, the patent to Miura et al. discloses in FIG. 2 a centrifuge that includes a rotor 1 disposed in a rotor chamber 2 defined by a rotor casing 2A. A sample or samples to be analyzed are placed in the rotor 1. The centrifuge of FIG. 2 also includes an enclosure with a motor-based drive device 5, and a vertically-extending rotary shaft 6. The rotor 1 is coaxially or concentrically mounted on an upper end of the

rotary shaft 6. A lower portion of the rotary shaft 6 concentrically or coaxially extends into the drive device 5. The rotary shaft 6 is rotatably supported by bearings with respect to the drive device 5. The drive device 5 rotates the rotary shaft 6 and the rotor 1. The rotary shaft 6 is designed to be flexible. Thus, the rotary shaft 6 is also referred to as the flexible shaft 6. The centrifuge of FIG. 2 further includes a support frame or base 3 on which the rotor casing 2A is mounted. The rotor casing 2A extends above the support frame or base 3. The support frame 3 is located between the rotor casing 2A and the drive device 5. The support frame 3 extends above and near an outer circumferential portion of the drive device 5. The support frame 3 has a central opening through which the rotary shaft 6 extends. The drive device 5 is suspended to the support frame 3 by viscoelastic support members 4 and suspensions 7. The viscoelastic support members 4 are provided between the lower surface of the support frame 3 and the upper surface of a body of the drive device 5. The suspensions 7 are provided between outer portions of the support frame 3 and outer portions of a lower end of the body of the drive device 5. The viscoelastic members 4 are made of suitable material, such as vibration isolating rubber, which has both an elasticity and a viscosity. The suspensions 7 include wire ropes or piano wires. The viscoelastic members 4 and the suspensions 7 are in parallel with each other regarding the drive device 5. The suspensions 7 extend radially outward of the viscoelastic members 4. The lower end of the body of the drive device 5 has an outwardly-projecting bottom flange (a horizontally-projecting bottom flange) 5A. The suspensions 7 connect the outer portions of the support frame 3 and the outer edges of the bottom flange 5A of the drive device 5. The

suspensions 7 cause the drive device 5 to have a given degree of freedom to move along a horizontal direction (or a radial direction). The suspensions 7 apply a force to the drive device 5 which constrains the drive device 5 as viewed in a vertical direction. Thus, the suspensions 7 locate the drive device 5 in the vertical direction or the axial direction. Upper ends of the suspensions 7 are provided with adjusters 8 connected to the support frame 3. Lower ends of the suspensions 7 are provided with adjusters 8 connected to the bottom flange 5A of the drive device 5. The adjusters 8 include screws for adjusting the lengths of the suspensions 7. The adjusters 8 may be omitted from the upper ends of the suspensions 7. Alternatively, the adjusters 8 may be omitted from the lower ends of the suspensions 7. The adjusters 8 are similar to each other. As shown in FIG. 3, the adjuster 8 includes a screw 15 and positioning members 16. The positioning members 16 are rotatably provided on the upper and lower surfaces of the bottom flange 5A of the drive device 5, respectively. The screw 15 extends through threaded holes in the positioning members 16. Thus, the screw 15 engages the positioning members 16. The lower end of the wire in the suspension 7 is connected with an upper end of the screw 15. As the positioning members 16 are rotated, the screw 15 moves axially or vertically so that the length (the vertical length) of the suspension 7 changes. It should be noted that the positioning members 16 may be integral with each other. A tilt of the drive device 5 can be varied and can be removed by operating the adjusters 8. Preferably, the tilt of the drive device 5 is nullified via the adjusters 8 so that the axes of the drive device 5 and the rotary shaft 6 will be parallel with the direction of the gravity. The viscoelastic support members 4 have a

predetermined spring modulus K1 defined in the horizontal direction (or the radial direction). The suspensions 7 have a predetermined spring modulus K2 defined in the horizontal direction (or the radial direction). The rotary shaft 6 has a predetermined spring modulus K defined in the horizontal direction (or the radial direction). Preferably, the spring modulus K3 equal to the sum or resultant of the spring modulus K1 of the viscoelastic members 4 and the spring modulus K2 of the suspensions 7 is smaller than the spring modulus K of the rotary shaft 6. In this case, during rotation of the rotor 1, the drive device 5 is allowed to move (vibrate) in the horizontal direction according to a whirl or a bend of the rotary shaft 6 out of true. Therefore, it is possible to effectively reduce a load on the bearings for the rotary shaft 6 which is caused by an imbalance in the rotor 1 or an imbalance in the sample arrangement. The reduction in the bearing load prevents the occurrence of a plastic deformation of the rotary shaft 6 and a damage thereto. The viscosity of the viscoelastic members 4 is set to a predetermined great value so that the viscoelastic members 4 can effectively damp the horizontal-direction vibration of the drive device 5, and can provide a sufficient stability of the drive device 5. The suspensions 7 limit the degree of vertical-direction expansion of the viscoelastic members 4, thereby preventing the viscoelastic members 4 from being subjected to loads in the vertical direction (the axial direction). The viscoelastic members 4 can also effectively damp the whirl of the rotary shaft 6. The drive device 5 resonates when the rotor 1 is rotated at one of specific speeds (resonant speeds). The viscoelastic members 4 can effectively damp the horizontal-direction vibration of the drive device 5.

The centrifuge of FIG. 2 has the following advantages. Even in the case where the rotor 1 is rotated while a great imbalance exists in the rotor 1, the viscoelastic members 4 can sufficiently deform in the horizontal direction, and therefore can effectively damp the horizontal-direction vibration of the drive device 5. The damping effect of the viscoelastic members 4 decreases the amplitude of resonance vibration of the drive device 5. Even in the case where the rotor 1 has a great weight, the degree of vertical-direction expansion of the viscoelastic members 4 can surely be limited by the suspensions 7. Accordingly, the centrifuge of FIG. 2 is able to properly operate even when a great imbalance exists in the rotor 1 or even when the rotor 1 has a great weight. In addition, it is possible to stably and safely rotate the rotor 1.

20. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al. (US 4,010,893).

The patent to Smith et al. discloses a centrifuge comprising a base 26, 27; an enclosure 36 mounting a motor 30; a rotor 45 rotatably mounted on said motor; a resilient support 41 extending between said base 26, 27 and said enclosure 36; wherein said support 41 engages said enclosure at a location that is inherently aligned with the force applied by said rotor resulting from imbalance of said rotor since the support is adapted to damp the imbalance forces; said support 41 comprises a resilient element that engages said enclosure 36.

More particularly, the patent to Smith et al. discloses in a centrifuge 20 in FIG. 1 that includes a stator portion 21 and a rotor portion 22. The stator includes an

interconnected top half 23 and a bottom half 24. A pivoted cover 25 is mounted to the top half 23. The interior of the stator 21 is hollow so as to form an interior chamber or base 26, 27. Bottom half 24 is bowl-shaped in configuration with three legs 27 of the base that extend downwardly. A peripheral skirt 28 extends downwardly on lower portion 24 of stator 21 and encompass legs 27 therein. Also housed within shirt 28 is the electrical control center 29 and the drive motor 30. Drive motor 30 is mounted on plate 36 on the interior of skirt 28 in an appropriate fashion such as by bolts and nuts 37 as shown. Two feet 39 extend downwardly from skirt 28 for resting on a supporting surface. The feet 39 are resilient in nature to minimize vibration noise and movement of the centrifuge during operation. Two similar feet 40 extend downwardly from legs 27 to balance the centrifuge 20 on the supporting surface. Also secured to legs 27 are resilient support bases 41 which support plate or enclosure 36 by a conventional means such as screws 42. The resilient bases 41 provide a further isolation of internal parts of the centrifuge against rotor vibration. Motor 30 extends upward through an opening 43 in the lower portion 24 of stator 21 and has a central shaft 44 extending upwardly into chamber 26 on which is mounted the rotor 45. Keyway 45' in the center of the rotor mates with the shaft configuration of shaft 44 so that the rotor rotates with the shaft. A removable locking knob 46 is centrally located and is affixed to shaft 44 to hold the rotor cover 46' in position. Rotation of the shaft 44 of drive motor 30 causes rotation of rotor 45 during operation of the centrifuge. A resilient circular bumper 47 is located and mounted on an annular rib 48 of stator 21 at the point where motor 30 passes through aperture 43. The bumper 47 engages with the shoulder 48 and with the outer surface of

the motor to dampen vibrations and to seal the motor to the lower portion 24 of stator 21. Rotor 45 is in the general shape of a circular disc and contains eight sample stations about its periphery. Noise level is held at a low level for the centrifuge due to the various resilient means as described above about the surfaces of the centrifuge where components interengage. Among the resilient structures are circular tubing 47, resilient bases 41, the resilient gasket material 81 and the resilient type feet 39 and 40.

21. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohtsu et al. (US 6,132,354).

The patent to Ohtsu et al. discloses a centrifuge comprising a base 12; an enclosure 1, 2 mounting a motor 3; a rotor 8 rotatably mounted on said motor; a resilient support 5, 6 extending between said base 12 and said enclosure 1, 2; wherein said support 5, 6 engages said enclosure at a location that is inherently aligned with the force applied by said rotor resulting from imbalance of said rotor since the support is adapted to damp the imbalance forces; said support 5, 6 comprises a resilient element that engages said enclosure 1, 2.

More particularly, the patent to Ohtsu et al. discloses a centrifuge 100 that includes an enclosure 1, 2, and a cup-like inner casing or base 12. The inner casing or base 12 defines a chamber along with a cover 13 in which a rotor 8 is disposed. The rotor 8 is rotatably supported by a rotor shaft 7. The rotor shaft 7 is mounted in a bearing installed in a bracket 4 secured on a bottom wall of the inner casing 12 and connected to an electric motor 3. The motor 3 is installed on the bracket 4. Disposed

between the bracket 4 and the inner base 2 are four damper support assemblies each consisting of a rubber tube 6 and a spring 5 pressed in the rubber tube 6. The rotor 8 has disposed on ends thereof buckets 9 for mixtures such as liquid solutions to be separated by rotation of the rotor 8. The buckets 9 are pivotably supported by pins 10. The buckets 9 are urged outward in a horizontal direction by the centrifugal force produced by high-speed rotation of the rotor 8. In the centrifuge 100, the rotor 8 is induced to oscillate at a resonant speed which is determined by the mass and moment of inertia of the motor 3 and the rotor 8 and the spring constant and damping coefficient of the damper assemblies consisting of the springs 5 and the rubber tubes 6. Such vibrations may, thus, be attenuated by optimizing the damping coefficient.

22. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Stallman et al. (US 3,322,338).

The patent to Stallman et al. discloses a centrifuge comprising a base 11, 36; an enclosure 28 mounting a motor 34; a rotor 13 rotatably mounted on said motor; a resilient support 37 extending between said base 11, 36 and said enclosure 28; wherein said support 37 engages said enclosure at a location that is inherently aligned with the force applied by said rotor resulting from imbalance of said rotor since the support is adapted to damp the imbalance forces; said support 37 comprises a resilient element that engages said enclosure 28.

23. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 62-236593.

JP 62-236593 discloses a centrifuge comprising a base 1; an enclosure 4 mounting a motor 8; a rotor 2 rotatably mounted on said motor; a resilient support 15, 22, 23 extending between said base 1 and said enclosure 4; wherein said support 15, 22, 23 engages said enclosure at a location that is inherently aligned with the force applied by said rotor resulting from imbalance of said rotor since the support is adapted to damp the imbalance forces; said support 15, 22, 23 comprises a resilient element 22 that engages said enclosure 4.

24. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Hutchins et al. (US 5,045,047).

The patent to Hutchins et al. discloses a centrifuge comprising a rotor 34, 40; a frame 58 or 152 pivotally attached to the rotor and adapted to receive a processing unit; a decant ring mechanism 300 (Figs. 1 and 8) movable with respect to the rotor to retain said frame and processing unit in a desired orientation (Fig. 10), wherein said ring 300 engages a portion of said processing unit to hold said processing unit in said desired orientation (Fig. 9).

More particularly, the patent to Hutchins et al. discloses in FIG. 1, a centrifuge 11 that includes a bowl 12 having an upper lip 14. The bowl 12 is supported above a plate 16 by posts 18 that are secured to the lip 14. A first motor 20 is secured to the plate 16 and includes a drive shaft 22 which extends into the bowl 12. When actuated by the

motor 20, the shaft 22 raises or lowers an inner mixing-orientation decant ring mechanism 300. A second motor 26 is secured to the plate 16 and includes a shaft 28 which extends into the bowl 12. When actuated by the motor 26, the shaft 28 raises or lowers an outer mixing-orientation mechanism 320. Although single actuating shafts 22 and 28 are shown in the interest of clarity, it will be understood that plural, symmetrically disposed activating shafts are preferred for each of the mechanisms 300 and 320. A third motor 30 is secured to the plate 16 and includes a shaft 32 which drives the rotor 34. Controliing the operation of the motors 20, 26 and 30 is a circuit 24. Fixed to the shaft 32 is a platform 40 that slidably carries an inner ring 50 which retains a circular array of inner tubes 64 having open upper ends 60 (FIG. 5). An inner dispensing assembly 100 is fixed to the platform 40 and includes a central hub portion 102 and radially extending inner dispensing arms 104. Passing through each arm 104 is a passage 103 that terminates at an inner outlet port 105. Slidably mounted on the inner ring 50 is an outer ring 140 which retains a circular array of outer container tubes 118 having open upper ends 155 (FIG. 6). The outer tubes 118 are disposed radially outwardly and above the inner tubes 64. Both inner and outer tube arrays are concentrically positioned with respect to the centrally located rotor shaft 32. Mounted in the bowl 12 is an annular trough 110 for receiving waste decanted from the tubes 64 and 118. Secured to the inner assembly 100 is an outer dispensing assembly 200 which includes a central hub portion 210 and radially extending outer arms 205. Passing through each arm 205 and the hub portion 210 is a passage 206 that terminates at an outer outlet port 207. An outer manifold 209 is retained by the hub portion 210 and

defines an inner inlet port 215 communicating through a central channel 213 with the inner passages 103 via passages 112, 114 in an inner manifold 106 retained by the hub 102. The outer manifold 202 also defines an outer inlet port 204 communicating with the outer passages 206 via passages 216. The inner mixing-orientation mechanism 300 is an integral unit including an upper circular band 304 and a lower circular ring 301 joined by vertical struts 305. Formed on the lower ring 301 is a beveled actuator surface 302 arranged to engage holders of the inner tubes 64 upon movement of the inner mechanism 300 into an upper position. The upper mixing band 304, preferably made from a resilient material such as rubber, is arranged to engage the outer surfaces of the inner tubes 64 upon upward movement of the assembly 300 into an intermediate position. Similarly, the outer mixing-orientation mechanism 320 is an integral unit including an upper circular band 324 and a lower circular ring 321 joined by vertical struts 326. Formed on the lower ring 321 is a beveled actuator surface 322 arranged to engage holders of the outer tubes 118 upon movement of the outer assembly 320 into an upper position. The upper mixing band 324, preferably made from a resilient material such as rubber, is arranged to engage the outer surfaces of the outer tubes 118 upon upward movement of the assembly 320 into an intermediate position. The outer dispensing assembly 200, the inner dispensing assembly 100, and the platform 40 are secured together by bolts (not shown) and as a unit are keyed for rotation to the rotor shaft 32. Coupling the shaft 32 to the inner ring 50 is an inner coupling consisting of the inner arms 104 and opposing shoulder portions 55, 57 of the inner ring 50 shown in FIG. 5. Each pair of the shoulders 55, 57 is positioned to alternately engage one of the

inner arms 104 and thereby establish a limited given degree of relative angular motion between the inner dispensing mechanism 100 and the inner ring 50. With the rotor shaft 32 turning clockwise, the inner arms 104 engage the shoulders 57 to drive the inner ring 50 also in a clockwise direction. Conversely, with the shaft 32 turning counterclockwise, the inner arms 104 engage the shoulders 55 to drive the inner ring also counterclockwise. Coupling the outer ring 140 to the inner ring 50 is an outer coupling consisting of a pair of pins 48 on the upper surface of the inner ring 50 and a receiving pair of slots 159 on the bottom surface of the outer ring 140. The pins 48 alternately engage opposite ends of the slots 159 and thereby limit relative angular motion between the inner ring 50 and the outer ring 140. With the shaft 32 turning clockwise, the pins 48 engage first ends of the slots 159 to drive the outer ring 140 clockwise and, with the shaft turning counterclockwise, the pins engage opposite ends of the slots 159 to drive the outer ring counterclockwise. Thus, the inner and outer couplings establish between the shaft 32 and the outer ring 140 a predetermined degree of relative angular motion equal to the sum of the given relative motion provided between the shaft 32 and the inner ring 50 by the inner coupling and the relative angular motion provided between the outer ring 140 and the inner ring 50 by the outer coupling. The relative angular positions of the inner and outer rings 50, 140 for opposite senses of shaft rotation are illustrated in FIGS. 2 and 3. With the shaft 32 turning counterclockwise, the inner tubes 64 are in transfer positions radially aligned with the outer tubes 118, the inner dispensing arms 104 and inner outlets 105 are in feed positions radially aligned with the inner tubes 64, and the outer dispensing arms 205 and outer outlets 207 are in feed

positions radially aligned with the outer tubes 156 as shown in FIG. 2. Conversely, with the shaft 32 turning clockwise, the inner tubes 64 are in decanting positions radially misaligned with the outer tubes 118, but radially aligned with discharge passages 157 in the outer ring 140. The inner arms 104 and inner outlets 105 are in purge positions radially misaligned with the inner tubes 64 but radially aligned with discharge passages 67 (FIG. 5) in the inner ring 50, and the outer arms 205 and outer outlets 207 are in purge positions radially misaligned with the outer tubes 118 but radially aligned with the discharge passages 157 as shown in FIG. 3. Referring to FIG. 4, the platform 40 is keyed to the shaft 32 and has a surface 42 for slidably supporting the inner ring 50 and shoulder and head portions 44, 46 fixed to the inner dispensing assembly 100. The inner ring 50 has circumferentially distributed sections 52 separated by openings 51 in which the inner tubes 64 are received. Remaining structure of the inner ring 50 will be described below with reference to FIG. 5. Joining the sections 52 is an internal circular flange portion 53. The inner dispensing assembly 100 includes the dispensing arms 104 which project from a manifold 102. Formed in the manifold are bolt holes 108a-d and a central shoulder portion 106 is received by the outer dispensing assembly 200. The outer ring 140 has an inwardly extending, annular flange 141 that supports the outer dispensing assembly 200. Remaining structure of the outer ring 140 will be described below in reference to FIG. 6. Referring to FIGS. 4 and 5, each opening 51 in the inner ring 50 retains a trunnion 56. Secured to each trunnion 56 is a sleeve 58 which retains a roller bearing 60 at its lower end. An open window 62 is formed in the outer lower end of each sleeve 58. The inner tubes 64 are received in the sleeves with their

open upper ends (mouths) extending beyond the upper surface of the inner ring 50. Supporting each trunnion 56 are facing walls 66 and 68 of the adjacent wedge-shaped sections 54. An inner edge of the wall 66 includes a lip 55 and an inner edge of the wall 68 is characterized by a recess 57. The motion of the dispensing arms 104 (a single arm shown in fragmentary perspective in FIG. 5) is limited by engagement with the lips 55 and recesses 57. When a dispensing arm 104 abuts the lip 55, the dispensing arm is in fluid flow alignment with a tube 64. Conversely, when the dispensing arms 104 engage the recess 57, the open mouth of the tubes 64 may be accessed such as for decanting. Referring to FIGS. 4 and 6, the outer ring 140 comprises circumferentially distributed pie-shaped sections 142. Defined between outer portions of the adjacent sections 142 are openings 146. Also defined by inner portions 148 of the sections 142 and extending transversely from the openings 146 are recesses 144 that accommodate the outer dispensing arms 205. Pinned to opposed surfaces of the adjacent sections 142 are trunnions 150 which support sleeves 152 extending downwardly therefrom. The bottom ends of the sleeves 152 having roller bearings 154 thereon and the outside lower portion of the sleeves 152 are characterized by open windows 156. When the outer tubes 118 are received in the sleeves 152, their open upper ends (mouths) extend beyond the upper surface of the outer ring 140. A flange 141 is formed integrally with the inwardly facing surfaces of the sections 148 and the recesses 144 defined thereby are shown most clearly in FIG. 4. These recesses 144 allow for liquids to be transferred between the tubes of the inner and outer rings 50, 140. When the dispensing arms 205 abut first sides of the recesses 144, they are in fluid flow communication with the outer

tubes 118. Conversely, with the mechanism 200 moved such that the dispensing arms 205 abut opposite sides of the recesses 144, the arms 205 are out of alignment and the tubes 118 so as to be available for other operations such as decanting, etc. Referring to FIG. 8, the inner and outer mixing-orientation assemblies 300 and 320 are shown in greater detail. The inner assembly 300 comprises the mixing band 304 spaced above and secured by struts 305 to the orientation ring 301. The inner cam surface 302 of the ring 301 slopes downwardly and inwardly as shown. When the inner assembly 300 is raised from a lower inactive position to an intermediate mixing position, the band 304 projects through the open windows 62 of the sleeves 58 to engage the inner tubes 64 that are being revolved by the inner ring 50 (FIG. 9). This engagement between the band 304 and the surfaces of the inner tubes 64 causes them to rotate individually on their own axes. When the inner assembly 300 is raised to an upper position, the sloped cam surface 302 engages the roller bearings 60 of the sleeves 58 to move the tubes 64 into decanting position shown in FIG. 10. This engagement prevents movement of tubes 64 into centrifuge positions and maintains the mouths of the tubes 64 facing outwardly as shown. Thus, in response to rotation of the shaft 32, centrifugal force will cause liquid within the tubes 64 to be discharged outwardly. The outer assembly 320 is structurally and functionally similar to the inner assembly 300 and cooperates with the outer ring 140. Included in the outer assembly 320 is a mixing band 324 joined by struts 326 to an outer orientation ring 321 having a sloped cam surface 322. The outer assembly 320 can be moved from an inactive lower position into either an upper position or an intermediate position and thereby control movement of the outer tubes 118 into either

mixing or decanting positions in the same manner as described above for the inner assembly 300. When a centrifuging function is required, the inner and outer mixing-orientation mechanisms 300, 320 are maintained in their lower inactive positions and the shaft 32 is activated to produce high speed rotation of the inner and outer rings 50, 140. Resultant centrifugal force causes the inner and outer sleeves 58, 152 to pivot outwardly into centrifuge positions with the open mouths of the inner and outer tubes 64, 118 facing inwardly as shown in FIGS. 5 and 6. Centrifuging in that manner can occur with the rotor 32 turning in either a clockwise or a counterclockwise direction. To mix the contents of either the inner or outer tubes 64, 118, the associated mixing-orientation mechanism 300 or 320 is raised to its intermediate position. When the rotor 32 begins to spin, the tubes start to swing outwardly but one of the mixing bands 304 or 324 prevents further travel and frictionally engages the exposed portions of all tubes 64 or 118 causing each tube to rotate about its axis vigorously and continuously mixing its contents as shown in FIG. 9. When liquid transfer between inner and outer tubes is desired, the orientation assembly 300 is raised to its upper position with the rotor 32 at rest. As the mechanism 300 moves up, the sloping surface 302 engages the bearings at the bottom of each sleeve 58 forcing it inwardly and moving the mouths of the inner tubes 64 outwardly into decanting position as shown in FIG. 10 and preventing subsequent movement into their centrifuge positions. The bearings 60 and 154 allow the sleeves 58, 152 to travel on the sloping surfaces 302 and 322 without binding. With the rotor 32 moving counterclockwise, the inner and outer tubes 64 and 118 are radially aligned as shown in FIG. 2. Thus, the mouths of the outer tubes 118, which are in

centrifuge ppsitions, are positioned directly opposite those of the inner tubes 64 which are in decanting positions as shown in FIG. 10. Consequently, liquid from the inner tubes 64 pours into the outer tubes 118 due to centrifugal force. The outer tubes 118 can be emptied with the rotor turning in either a clockwise or a counterclockwise direction by moving the outer orientation assembly into its upper position. That forces the outer tubes 118 into their decanting positions and centrifugal force causes liquid to be discharged outwardly from the outer ring 140. Emptying of the inner tubes 64, however, requires clockwise rotation of the shaft 32 to produce the misalignment of the inner and outer tubes shown in FIG. 3. In that case, with the inner orientation mechanism 300 in its upper position, the inner tubes will be in decanting position and their liquid contents will be discharged through the discharge passages 157 in the outer ring 140. For metering fluid into either the inner or outer tubes 64, 118, the shaft 32 is turned counterclockwise to provide the angular position shown in FIG. 2, and the associated orientation mechanism 300 or 320 remains in its lower inactive position. In that case both inner and outer tubes will be forced in centrifuge positions with their mouths radially aligned, respectively, with the inner and outer dispensing arms 104 and 205. Fluid introduced into the inner inlet port 115 will be evenly distributed by centrifugal force into the feed passages 103 for discharge through the inner outlet ports 105 into the mouths of the inner tubes 64. Similarly, fluid introduced in the outer inlet port 204 will be evenly distributed into the feed passages 206 for discharge through the outer outlet ports 207 into the mouths of the outer tubes 118. Purging of either the inner or outer dispensing assembly 100, 200 requires clockwise rotation of the shaft 32 to

provide the angular positions shown in FIG. 3 with the inner dispensing arms 104 aligned with the discharge passages 67 in the inner ring 50 and the outer dispensing arms 205 aligned with the discharge passages 157 in the outer ring 140. Purging fluid introduced into the inner inlet 215 then will flow through the passages 103 for discharge through the outlet ports 105 and the discharge passages 67. Similarly, purging fluid introduced into the outer inlet 204 will flow through the passages 206 for discharge through the outer outlet ports 207 and the discharge passages 157. Depending on the direction of rotation of the rotor shaft 32 and the elevational positions of the inner and outer orientation mechanisms 300, 320, the apparatus 11 can function in sixteen different operating modes as follows:

Mode 1 in which the rotor 32 turns counterclockwise and the inner and outer assemblies 300, 320 are both in lower inactive positions. In Mode 1, both inner and outer tubes 64, 118 are in centrifuge positions and radially aligned, respectively, with the inner and outer dispensing ports 105, 207. Thus, the inner and outer tubes 64, 118 can be both centrifuged and filled in this mode.

Mode 2 in which the rotor 32 turns counterclockwise, the inner mechanism 300 is in its intermediate position and the outer mechanism 320 is in its lower position. In Mode 2 the outer tubes 118 assume centrifuge positions and the inner tubes 64 engage the inner band 304. Thus, the inner tubes 64 can be mixed and the outer tubes 156 centrifuged in this mode.

Mode 3 in which the rotor 32 turns counterclockwise, the inner mechanism 300 is in its lower position and the outer mechanism 320 is in its intermediate position. In Mode

3, the inner tubes 64 assume centrifuge positions and the outer tubes 118 engage the outer band 324. Thus, the inner tubes 64 can be centrifuged and the outer tubes 118 mixed in this mode.

Mode 4 in which the rotor 32 turns counterclockwise, and both the inner and outer mechanisms 300, 320 are in intermediate positions. In Mode 4, both inner and outer tubes 64, 118 assume mixing positions and their contents are mixed.

Mode 5 in which the rotor 32 turns counterclockwise, the inner mechanism 300 is in its upper position and the outer mechanism 320 is in its lower position. In Mode 5, the inner tubes 64 are in decant positions and the outer tubes 156 assume centrifuge positions. Thus, the liquid contents of the inner tubes 64 can be transferred to the outer tubes 118 in this mode.

Mode 6 in which the rotor 32 turns counterclockwise, the inner mechanism 300 is in its lower position and the outer mechanism 320 is in its upper position. In Mode 6, the inner tubes 64 assume centrifuge positions and the outer tubes 118 are in decant positions. Thus, the inner tubes 64 can be centrifuged and the outer tubes 118 decanted in this mode.

Mode 7 in which the rotor 32 turns counterclockwise, the inner mechanism 300 is in its intermediate position and the outer mechanism 320 is in its upper position. In Mode 7, the inner tubes 64 engage the inner band 304 and the outer tubes 118 are in decant positions. Thus, the inner tubes 64 can be mixed and the outer tubes 118 decanted in this mode.

In each of Modes 2-7, the inner feed ports 105 are radially aligned with the inner tubes 64 and the outer feed ports 207 are aligned with the outer tubes 118. Thus, the inner tubes 64 can be filled from the inner feed ports 105 in Modes 3 and 6 and the outer tubes 118 can be filled from the outer feed ports 207 in Modes 2 and 5.

In each of the following Modes 8-16, the inner feed passages 103 are out of radial alignment with the inner tubes 64 and the outer feed passages 206 are out of radial alignment with the outer tubes 118 and are in radial alignment, respectively, with the discharge passages 67, 157.

Mode 8 in which the rotor 32 turns clockwise and both the inner and outer mechanisms 300, 320 are in their lower positions. In Mode 8, both the inner and outer tubes 64, 118 assume centrifuge positions. Thus, the inner and outer tubes 64, 118 can be centrifuged and the inner and outer dispensing mechanisms 100, 200 can be purged in this mode.

Mode 9 in which the rotor 32 turns clockwise, the inner mechanism 300 is in its lower position and the outer mechanism 320 is in its intermediate position. In Mode 9, the inner tubes 64 assume centrifuge positions and outer tubes 118 engage the outer band 324. Thus, the inner tubes 64 can be centrifuged, the outer tubes 118 mixed and both the inner and the outer feed passages 103, 206 purged in this mode.

Mode 10 in which the rotor 32 turns clockwise, the inner mechanism 300 is in its lower position and the outer mechanism 320 is in its upper position. In Mode 10, the inner tubes 64 assume centrifuge positions and the outer tubes 118 are in decant

positions. Thus, the inner tubes 64 can be centrifuged, the outer tubes 118 decanted and both the inner and the outer feed passages 103, 206 purged in this mode.

Mode 11 in which the rotor 32 turns clockwise, the inner mechanism 300 is in its intermediate position and the outer mechanism 320 is in its lower position. In Mode 11, the inner tubes 64 engage the inner band 304 and the outer tubes 118 assume centrifuged positions. Thus, the inner tubes 64 can be mixed, the outer tubes 118 centrifuged and both the inner and the outer feed passages 103, 206 purged in this mode.

Mode 12 in which the rotor 32 turns clockwise and both inner and outer mechanisms 300, 320 are in intermediate positions. In Mode 12 both the inner and outer tubes 64, 118 engage, respectively, the inner and outer bands 304, 324. Thus, both inner and outer tubes 64, 118 can be mixed and both the inner and the outer feed passages 103, 206 purged in this mode.

Mode 13 in which the rotor 32 turns clockwise, the inner mechanism 300 is in its intermediate position and the outer mechanism 320 is in its upper position. In Mode 13, the inner tubes 64 engage the inner band 304 and the outer tubes 118 are in decant positions. Thus, the inner tubes 64 can be mixed, the outer tubes 118 decanted and both the inner and the outer feed passages 103, 206 purged in this mode.

Mode 14 in which the rotor 32 turns clockwise, the inner mechanism 300 is in its upper position and the outer mechanism 320 is in its lower position. In Mode 14, the inner tubes 64 are in decant positions, the outer tubes 118 assume centrifuge positions and the inner tubes 64 are radially aligned with the discharge passages 157. Thus, the

inner tubes 64 can be decanted, the outer tubes 118 centrifuged and both the inner and the outer feed passages 103, 206 purged in this mode.

Mode 15 in which the rotor 32 turns clockwise, the inner mechanism 300 is in its upper position and the outer mechanism 320 is in its intermediate position. In Mode 15, the inner tubes 64 are in decant positions, the outer tubes 118 engage the outer band 324 and the inner tubes 64 are radially aligned with the discharge passages 157. Thus, the inner tubes 64 can be decanted, the outer tubes 118 mixed and both the inner and the outer feed passages 103, 206 purged in this mode.

Mode 16 in which the rotor 32 turns clockwise and both the inner and outer mechanisms 300, 320 are in their upper positions. In Mode 16, both inner and outer tubes 64, 118 are in their decant positions and the inner tubes 64 are radially aligned with the discharge passages 157. Thus, both inner and outer tubes 64, 118 can be decanted and both the inner and the outer feed passages 103, 206 purged in this mode.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The cited prior art discloses centrifuges with rings elements thereon and damping systems for centrifuges.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E. Cooley whose telephone number is (571)

272-1139. The examiner can normally be reached on Mon-Fri. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

27. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles E. Cooley
Primary Examiner
Art Unit 1723

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